

# Alcatel-Lucent 1671 Service Connect

Next Generation  
Multiservice Cross-Connect

Alcatel·Lucent 







Forward-looking businesses require solutions that allow them to realize advanced capabilities today, while charting a clear migration strategy from traditional equipment to next generation functionality. They demand the features and upgradeability that will keep pace with traffic demands regardless of how they grow over time. With the Alcatel-Lucent 1671 Service Connect (SC), you can be assured that your network will be well equipped, not only for present day demands, but also for future requirements.

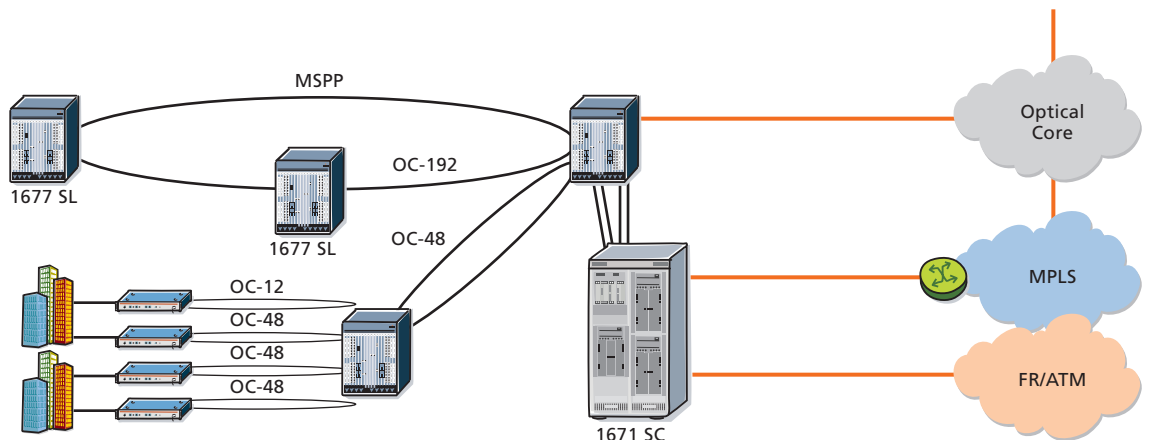
## Flexible to Fit Many Needs

No two customers are the same. One may be looking for a wideband cross-connect or a device that can handle narrowband, wideband and broadband traffic, another may need hot-swappable interface cards, virtual concatenation, or best in class channel protection. Whatever your requirements, the Alcatel-Lucent 1671 SC can be provisioned for a wide variety of applications.

The Alcatel-Lucent 1671 SC is a next generation, multiservice cross-connect designed to support the growing demand for multiple services, including traditional SONET services

as well as Ethernet and data aggregation. Engineered for speeds from DS1 to OC-192 and Ethernet, the Alcatel-Lucent 1671 SC goes beyond traditional cross-connect functionality to provide extensive grooming capabilities that maximize the efficiency of transport networks. The new, innovative Multi-Service Matrix (MSM) provides unrivaled density (4,608 DS3 equivalents) and a robust feature set that includes narrowband, wideband, broadband and data aggregation functionalities, while retaining the discreet Copy 0/Copy 1 redundancy that continues to be a signature feature of the Alcatel-Lucent 1671 SC.

Figure 1. Alcatel-Lucent 1671 SC as the Aggregation Point in a Multiservice Network



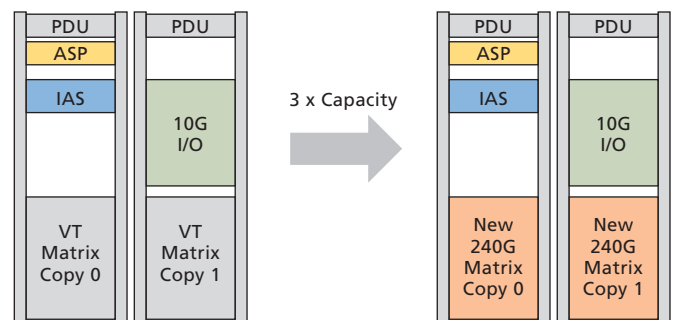


## Multi-Service Matrix

The Alcatel-Lucent 1671 SC allows service providers to maximize their network infrastructure through the efficient grooming and filling of transport pipes. By eliminating partially filled pipes, service providers can maximize network bandwidth, streamline their operations, and more cost-effectively manage and maintain their networks. A broad range of customer interfaces enables the Alcatel-Lucent 1671 SC to function as a multiservice aggregation point, efficiently bringing data and voice traffic flows into the SONET optical network. Figure 1 illustrates the Alcatel-Lucent 1671 SC as the aggregation point in a multiservice network.

The new MSM introduces narrowband, wideband and broadband switching in a single network element. The Virtual Tributary (VT) capacity is increased to 4608 DS3 equivalents or 240 Gb/s (240G), as illustrated in Figure 2; startling when one realizes that this capacity is housed in only two bays.

**Figure 2. The 80G Matrices Replaced with 240G Multi-Service Matrices**

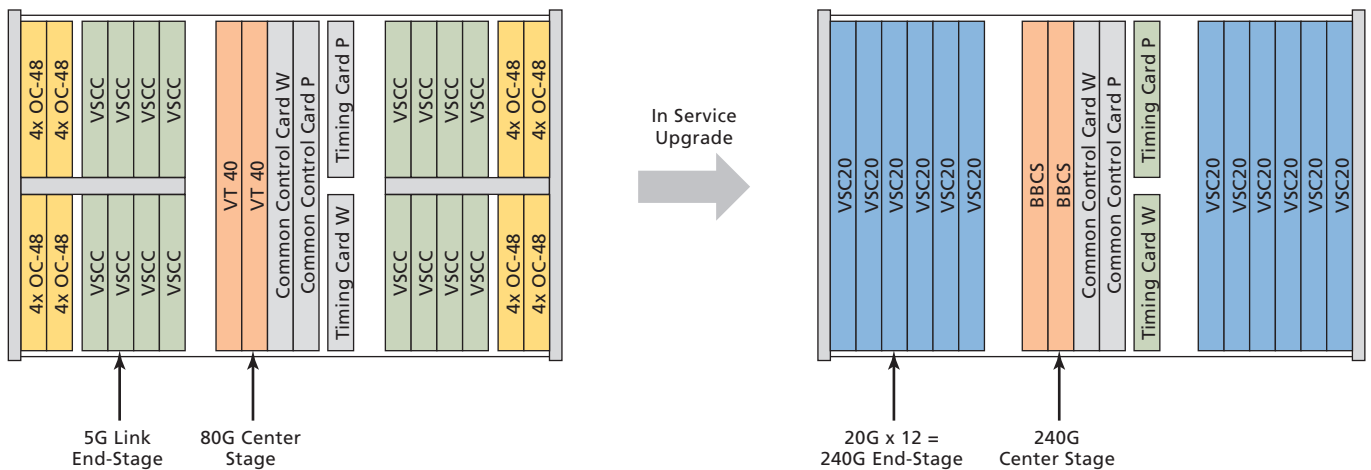




Network planners believe that maximizing revenue and minimizing cost is best achieved through the consolidation of network elements, which in turn leads to increased overall network efficiency. The Alcatel-Lucent 1671 SC provides a path for central office and network optimization by offering the features and densities needed to achieve these goals. The MSM is available on all new Alcatel-Lucent 1671 SC systems or can be added, in service, to all existing Alcatel-Lucent 1671 SC systems via a simple plug-in unit replacement, as illustrated in Figure 3.

The 80G center stage can be easily swapped out for the new 240G center stage, while the new 20G end stage cards, shown in blue, replace the functionality of the previously discrete 5G link end stage cards and switching cards, shown in yellow and green respectively. This allows the Alcatel-Lucent 1671 SC to offer 4,608 STS-1 equivalents in only two seven-foot racks, with Copy 0/Copy 1 redundancy, far outclassing the density of competitors' devices.

**Figure 3. The Multi-Service Matrix: Triple the Capacity in the Same Shelf Space**





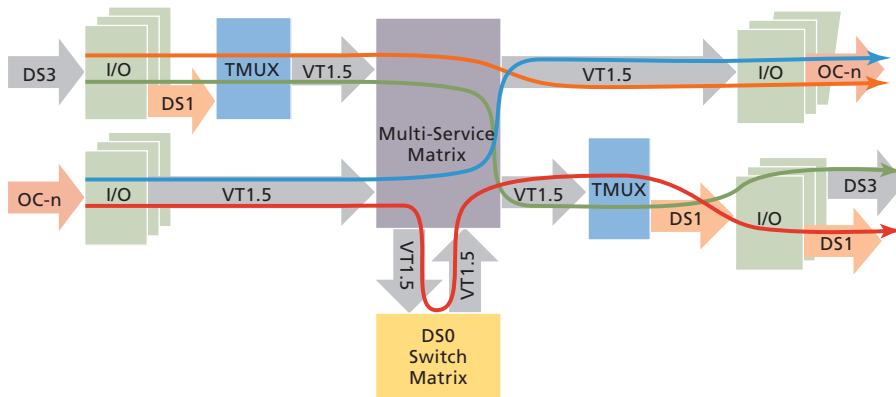
## Flexible Matrix

In addition to a full range of interfaces, the Alcatel-Lucent 1671 SC promotes network versatility by supporting a variety of network topologies. As a multiservice cross-connect, the Alcatel-Lucent 1671 SC offers a valuable solution for multi-protocol networks. As versatile as it is efficient, the Alcatel-Lucent 1671 SC provides VT1.5, DS0 and STS-n grooming, enabling carriers to maximize the productivity of their infrastructure.

Figure 4 illustrates how various protocols at differing bandwidths are switched by the non-blocking and versatile MSM. For example, the green line, which enters the I/O card as a DS3 wideband signal, is provisioned as a VT1.5 channel to pass

through the MSM. After switching and multiplexing, it is represented as a DS3 at the output. Correspondingly, the blue line enters an I/O card as an OC-12c signal which is then software provisioned as a broadband STS-12c clear channel. After switching, it is presented at another output as an OC-12c. For narrowband switching, the red line illustrates the entry of an OC-n signal that is software provisioned as VT 1.5 with DS0 grooming. The MSM hands off the VT signals to a dedicated DS0 switch matrix that completes the switching and then hands the signals back to the MSM. In this example, the narrowband signals are multiplexed to a DS1 output. All of these connections are internal and implemented via software commands.

Figure 4. The MSM: Stylistic Representation as Any-to-any Matrix



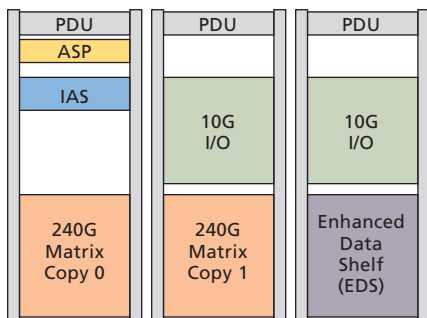


## Enhanced Data Shelf

The multiservice capabilities of the Alcatel-Lucent 1671 SC make it possible to extend the data network closer to the customer and to support adaptation to a unified multiprotocol label switching (MPLS) core. This allows the service provider to make more efficient use of expensive router ports provisioned for the delivery of data services, which leads to increased cost efficiencies. In fact, with a reduced delivery cost, it may be possible to extend services to areas where, in the past, it was not economically feasible to do so.

The Enhanced Data Shelf (EDS), illustrated in Figure 5, supports data applications such as data aggregation, Layer 2 switching and circuit emulation. By providing full SONET and data interworking, the Alcatel-Lucent 1671 SC can support legacy functionality now, and incrementally switch capacity over to data functionality as new services come on line; or it can be immediately commissioned as a data transport solution. The EDS accepts signals that include, but are not limited to, Gigabit Ethernet, clear channel and concatenated payloads, DS1, DS3, and OC-3 to OC-192 SONET; and this includes any-to-any connectivity.

**Figure 5. The Alcatel-Lucent 1671 SC with Enhanced Data Shelf**





## Customer Benefits

### Unrivaled Reliability

Reliability is critical in a next-generation network element and whether your business is transporting voice, data or video, the Alcatel-Lucent 1671 SC platform offers unrivaled performance reliability while exceeding NEBS Level 3 standards as defined in GR-63-CORE. The redundancy of all key components results in much greater resiliency when compared to the competition. The Alcatel-Lucent 1671 SC provides a Copy 0/Copy 1 physically diverse matrix structure in which traffic flows through both matrix copies while the I/O determines the best path. This allows for seamless scalability and ease of maintenance. In addition, the facility naming function allows hierarchical identification of downline facilities — right down to the DS0 level if required.

### Unparalleled Capacity with Room to Grow

The Alcatel-Lucent 1671 SC sets the new industry standard offering 240 Gb/s matrix capacity, with Copy 0/Copy 1 redundancy, in only two seven-foot I/O racks. When developing the Alcatel-Lucent 1671 SC, Alcatel-Lucent considered all types of businesses, large and small. The result is a per-rack capacity that scales in small increments promoting a pay-as-you-grow philosophy. Coupled with a wide array of customer interfaces, the Alcatel-Lucent 1671 SC is designed to meet the needs of a variety of customers and applications. This tremendous capacity, with its full breadth of interfaces, is already enabling businesses to maximize their network capabilities from the core to the edge, while eliminating the need for adjunct devices or overbuilds.

## MEETING YOUR TARGET

When considering how to maximize revenue from their customers, the majority of service providers have similar objectives:

- Deliver the greatest number of services
- Respond in the shortest time
- Do this cost effectively

The Alcatel-Lucent 1671 SC makes it possible for businesses to meet these objectives by providing superior density and unmatched scalability.



## Impressive Return on Investment

The driving forces for next generation networks are the maximization of return on investment through the reduction of CAPEX and OPEX, and the expansion of the range of services offered to end customers. The Alcatel-Lucent 1671 SC eases the migration from traditional services to the new, advanced services by safeguarding existing revenues from legacy services while simultaneously enabling new revenue streams. With the Alcatel-Lucent 1671 SC, I/O bays are interconnected using standard optical interfaces, simplifying installation. This means that racks can be remotely deployed, reducing space constraints and increasing deployment flexibility. Fewer bays with more flexibility decrease both OPEX and CAPEX, and the on-board OC-48 interface provide the opportunity to reduce the numbers of multiple leased circuits running at lower speeds.

## Dynamic Grooming

The 240 Gb/s MSM switching fabric on the Alcatel-Lucent 1671 SC allows for optimal grooming in a variety of customer applications, including DS0 grooming. In addition to reducing physical space requirements, the dual-functionality of the Alcatel-Lucent 1671 SC fabric benefits network operators by reducing the number of network elements which must be managed. Although new, cutting-edge technology is important to service providers, simplicity is still a focus. The dynamic switching subsystem of the Alcatel-Lucent 1671 SC creates an efficient scenario where traffic is categorized into narrowband, wideband or broadband as it traverses the cross-connect, thus eliminating any unnecessary grooming and the associated cost.



### Intelligent Network Adaptability

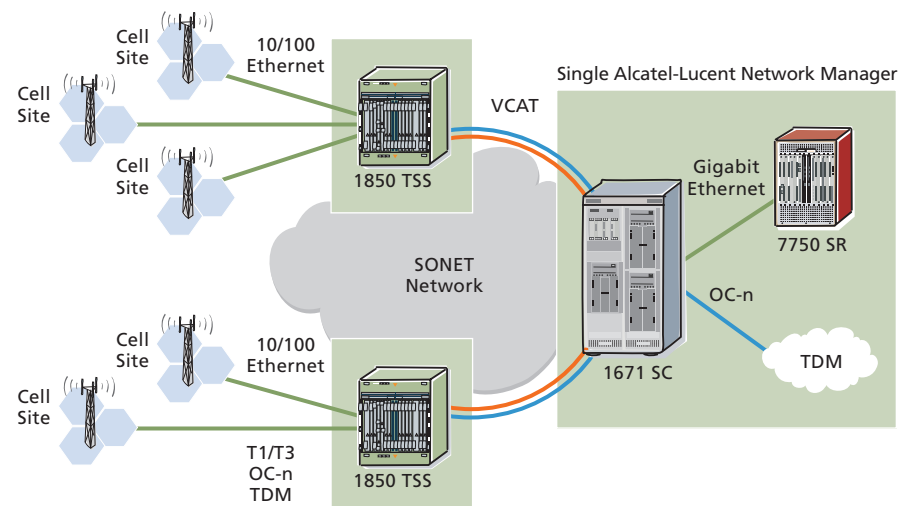
Next generation networks feature intelligent network elements capable of communicating on a common plane for the purposes of optimizing and routing traffic. This creates an ideal scenario for service providers who wish to maximize network efficiency.

Generalized Multi-Protocol Label Switching (GMPLS) is the protocol that enables this enhanced level of communication. The Alcatel-Lucent 1671 SC is a GMPLS-ready platform, preparing service providers for the intelligent networks that lie ahead without compromising their current revenue-generating services. As a multiservice cross-connect, the Alcatel-Lucent 1671 SC can function in a traditional or intelligent (GMPLS) network.

### A Safe Landing for Wireless Traffic

The role the Alcatel-Lucent 1671 SC can play in a wireless service provider's network illustrates many of the cross-connect's benefits. As more and more data traffic flows to and from cell phones, the Alcatel-Lucent 1671 SC cost effectively expands wireless market presence, providing next generation services to the end customer. As illustrated in Figure 6, the Alcatel-Lucent 1671 SC multiservice cross-connect can be networked with other Alcatel-Lucent devices to meet wireless service providers' needs. Alcatel-Lucent will be happy to provide a solution for your requirements.

Figure 6. Sample Network Including the Alcatel-Lucent 1850 TSS, the Alcatel-Lucent 1671 SC and the Alcatel-Lucent 7750 SR





### **Providing IXC's with a Converged Infrastructure**

The Alcatel-Lucent 1671 SC can also be used to enable interexchange carriers (IXCs) to collapse their narrowband, wideband and broadband switching layers into a single, converged infrastructure, as shown in Figure 1. In this scenario, the benefits to the IXCs include:

- High speed optical interfaces, which reduce local access fees
- Support for central office modernization to reduce hardware requirements and maximize network efficiency
- Data adaptation and aggregation

### **Leadership Shows**

Alcatel-Lucent continues to be recognized as an industry leader in advanced optical networking technologies, providing telecommunications solutions to businesses around the world. With an Alcatel-Lucent 1671 SC installed base in excess of 100 systems and its worldwide presence, Alcatel-Lucent offers its customers the right solutions, in the right markets, at the right times.

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